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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/624,589	07/23/2003	Masakazu Furukawa	240648US0DIV	7529

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ALEXANDRIA, VA 22314

EXAMINER

PAIK, SANG YEOP

ART UNIT	PAPER NUMBER
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3742

DATE MAILED: 01/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/624,589

Applicant(s)

FURUKAWA ET AL.

Examiner

Sang Y Paik

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 43 and 178 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-19, 22-24, 27-29, 32-34, 37-39, 42 and 43 is/are rejected.
- 7) ☒ Claim(s) 20, 21, 25, 26, 30, 31, 35, 36, 40 and 41 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/1/04, 9/23/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 17-19, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubota et al (US 5,643,483) or Natsuhara (US 6,458,444) in view of Thimm et al (US 5,560,851), Hurko (US 3,883,719) or Matsumura et al (US 5,151,871).

Kubota shows a ceramic heater including a ceramic made of a nitride ceramic with a lower surface having a roughness of 2 microns and with a heat conducting film or element having the thickness of 5 microns provided thereon. Kubota further shows that the heating film is provided by the screen printing and baking process by which the heating film was applied and dried before baking. Kubota also shows other processes such as sputtering and vapor-deposition processes. Natsuhara also shows a ceramic heater including a ceramic heater made of a nitride ceramic with a heating element screen printed thereon and baked. Natsuhara shows the ceramic heater having the surface roughness less than 2 microns as well as less than .2 microns. However, neither Kubota nor Natsuhara shows the thickness of the heating element is within ± 3 microns or less.

Thimm and Hurko show that it is well known in the art to provide a ceramic heater with a heating element having a uniform thickness to maintain a uniform heating across its heating

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surface. Matsumura also shows a ceramic heater having a heating element with a thickness between . 5 to 2 microns.

In view of Thimm, Hurko or Matsumura et al, it would have been obvious to one of ordinary skill in the art to adapt Kubota or Natsuhara with a heating element having a uniform thickness including the claimed range to maintain a uniform heating across its heating surface.

3. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kubota or Natsuhara in view of Thimm, Hurko or Matsumura as applied to claims 17-19, 22 and 23 above, and further in view of Fennimore et al (US 3,576,722) or DiGiacomo et al (US 5,442,239).

Kubota or Natsuhara in view of Thimm, Hurko or Matsumura discloses the process claimed except the resistance element made of a multilayer structure.

Fennimore shows a multilayer resistance pattern deposited on a ceramic substrate having a titanium layer being the first layer deposited thereon with additional layers such as copper and gold being deposited on the titanium layer. Fennimore teaches that the titanium layer serves as a good adhesion layer to the ceramic substrate. DiGiacomo also shows a multilayer structure with a titanium or chromium layer being the first layer deposited on the ceramic substrate. DiGiacomo teaches that such multilayer structure provides low stress, minimal corrosion and strong adhesion to the ceramic substrate.

In view of Fennimore or DiGiacomo, it would have been obvious to one of ordinary skill in the art to adapt Kubota or Natsuhara, as modified by Thimm, Hurko or Matsumura, with a multilayer structure with titanium or chromium being the layer nearest to the ceramic substrate to provide a resistance layer that provides low stress and corrosion while providing strong bonding of the resistance layer to the ceramic substrate.

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4. Claims 27-29, 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubota or Natsuhara in view of Thimm, Hurko or Matsumura as applied to claims 17-19, 22 and 23 above, and further in view of Nakamori et al (US 4,849,605).

Kubota or Natsuhara in view of Thimm, Hurko or Matsumura discloses the process claimed except RF sputtering.

Nakamori et al shows a resistive conductive film provided on an insulating plate with the RF sputtering process. In view of Nakamori et al, it would have been obvious to one of ordinary skill in the art to adapt Kubota or Natsuhara, as modified by Thimm, Hurko or Matsumura, with the RF sputtering process as an alternative process to provide a securely deposited resistive film to provide a good durability.

5. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kubota or Natsuhara in view of Thimm, Hurko or Matsumura and Nakamori as applied to claims 27-29, 32 and 33 above, and further in view of Fennimore et al (US 3,576,722) or DiGiacomo et al (US 5,442,239).

Kubota or Natsuhara in view of Thimm, Hurko or Matsumura and Nakamori discloses the hot plate claimed except the resistance element made of a multilayer structure.

Fennimore shows a multilayer resistance pattern deposited on a ceramic substrate having a titanium layer being the first layer deposited thereon with additional layers such as copper and gold being deposited on the titanium layer. Fennimore teaches that the titanium layer serves as a good adhesion layer to the ceramic substrate. DiGiacomo also shows a multilayer structure with a titanium or chromium layer being the first layer deposited on the ceramic substrate. DiGiacomo

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teaches that such multilayer structure provides low stress, minimal corrosion and strong adhesion to the ceramic substrate.

In view of Fennimore or DiGiacomo, it would have been obvious to one of ordinary skill in the art to adapt Kubota or Natsuhara, as modified by Thimm, Hurko or Matsumura and Nakamori, with a multilayer structure with titanium or chromium being the layer nearest to the ceramic substrate to provide a resistance layer that provides low stress and corrosion while providing strong bonding of the resistance layer to the ceramic substrate.

6. Claims 37-39, 42 and 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kubota or Natsuhara in view of Thimm, Hurko or Matsumura as applied to claims 17-19, 22 and 23 above, and further in view Morita et al (US 5,118,983) or Tsuruta et al (US 5,554,839).

Kubota or Natsuhara in view of Thimm, Hurko or Matsumura discloses the process claimed except the resistance element made of scaly noble metal powder.

Morita shows a hot plate made with a resistance element made of TiN, W as well as noble metals such as Pt with a glaze layer having the oxide and organic vehicle fused with the resistance element. Tsuruta et al shows a hot plate with a metal paste having the scaly noble metal including a noble metal such as platinum, alumina and an organic vehicle.

In view of Morita et al or Tsuruta et al, it would have been obvious to one of ordinary skill in the art to adapt Kubota or Natsuhara, as modified by Thimm, Hurko or Matsumura, with the heating element made of the scaly noble metals to provide a hot plate that is capable of withstanding a high thermal resistance and to further prevent cracks.

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Allowable Subject Matter

7. Claims 20, 21, 25, 26, 30, 31, 35, 36, 40 and 41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

8. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sang Y Paik whose telephone number is 571-272-4783. The examiner can normally be reached on M-F (9:00-4:00) First Friday Off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robin Evans can be reached on 571-272-4777. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. R

Sang Y Paik
Primary Examiner
Art Unit 3742

syp